

## Claims

- [c1] 1. A scanning circuit for a document scanner, comprising:  
a main circuit module for receiving a scanning instruction from a communication interface, converting the scanning instruction into scan control signals, passing the scan control signals to a connection cable as well as receiving a digital image data captured in a document scanning operation through the connection cable; and  
an optical sensor circuit module connected to the main circuit module through the connection cable for receiving the scan control signals and converting the scan control signals to timing control signals that control document scanning, extraction of an analog image signal from the document and conversion of the analog image signal into the digital image data.
- [c2] 2. The scanning circuit of claim 1, wherein the main circuit module further includes:  
a main control logic unit for receiving the scanning instruction and converting the scanning instruction into scan control signals and receiving digital image data;  
a memory unit for holding the digital image data; and  
a memory control logic unit coupled to the main control logic unit and the memory unit for controlling the access of digital image data.
- [c3] 3. The scanning circuit of claim 2, wherein the main control logic unit further includes an image preprocessor for compensating and adjusting the captured digital image data.
- [c4] 4. The scanning circuit of claim 2, wherein the memory is a dynamic random access memory.
- [c5] 5. The scanning circuit of claim 1, wherein the optical sensor circuit module further includes:  
an optical sensor for detecting and producing the analog image signal;  
an analog front-end processor coupled to the optical sensor for preprocessing the analog image signal;  
an analog/digital converter coupled to the analog front-end processor for

converting the pre-processed analog image signal into the digital image data;  
and  
a timing generator coupled to the optical sensor and the analog/digital  
converter for generating the timing control signals that control a generation of  
the analog image signal and a conversion of the captured analog image signal  
into the digital image data.

- [c6] 6. The scanning circuit of claim 5, wherein the optical sensor includes a charge-coupled device.
- [c7] 7. The scanning circuit of claim 5, wherein the optical sensor includes a complementary metal-oxide-semiconductor (CMOS) image sensor.
- [c8] 8. The scanning circuit of claim 1, wherein the connection cable includes a flat cable.
- [c9] 9. The scanning circuit of claim 1, wherein the communication interface includes a universal serial bus interface.
- [c10] 10. The scanning circuit of claim 1, wherein the scan control signals are transmitted through an integrated circuit (IC) communication interface.